

1969

**OPERATING
SUMMARY**

TILLSONBURG

***water pollution
control plant***

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JUN 26 1970

ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION

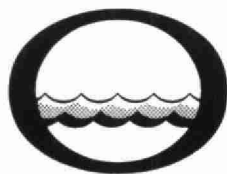
Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission

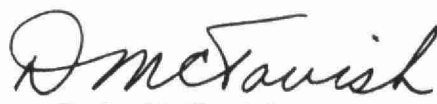
135 St. Clair Ave. W.
Toronto 195
Ontario

The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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ONTARIO WATER
RESOURCES COMMISSION

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TILLSONBURG
water pollution control plant

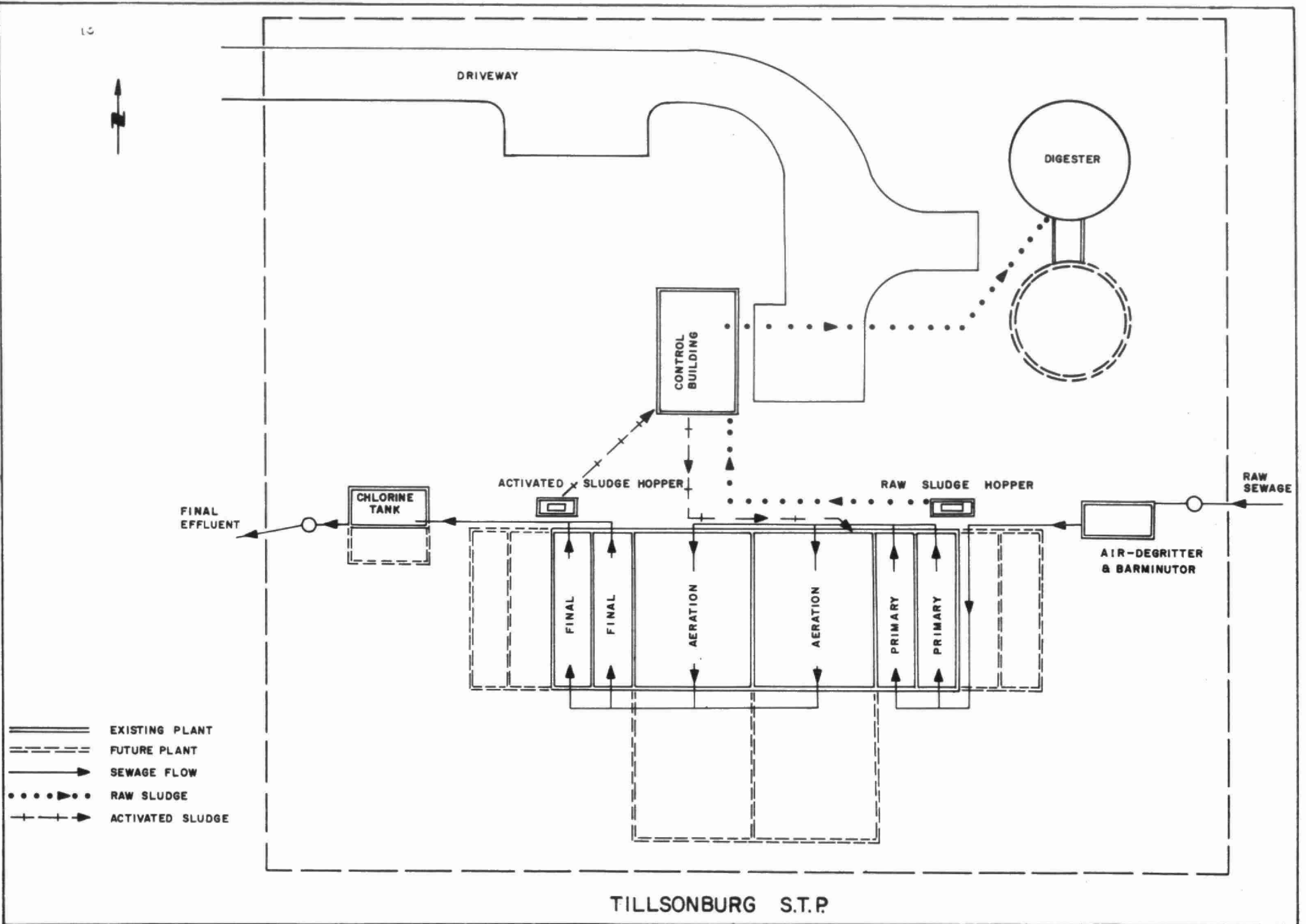
operated for

THE TOWN OF TILLSONBURG

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY



DESIGN DATA

PROJECT NO. 2-0012-58

DESIGN FLOW 0.665 mgd

DESIGN POPULATION 7,000

BOD - Raw Sewage 235 mg/l
 - Removal 95%

SS - Raw Sewage 250 mg/l
 - Removal 95%

PRIMARY TREATMENT

Comminution

Type: Barminutor
 Size: One Model "C" (18")

Grit Removal

Type: C.P. Aer-Degritter
 Size: One 13'x 6' x 8' (3,900 gal)
 Retention: 8.4 min

Primary Sedimentation

Type: Jeffrey
 Size: Two 50' 4" x 10' x 8' (50,300 gal)
 Retention: 1.82 hours
 Loading: Surface, 795 gal/ft²/day
 Weir, 16,000 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; single-pass
 Size: Two 50' x 30' x 13' (281,000 gal)
 Retention: 10.2 hours

Diffusers

Type: Walker Spargers
 Spacing: 28 @ 20" c-c (each tank)

Air Supply

Type: Roots-Connersville
 Size: Two 875 scfm @ 7.5 psi

Secondary Sedimentation

Type: Jeffrey
 Size: Two 50' 4" x 10' x 12' 3"
 (77,000 gal)
 Retention: 2.8 hours
 Loading: Surface, 795 gal/ft²/day
 Weir, 4820 gal/ft/day

CHLORINATION

Type: W & T A731
 Size: One 400 lb/day

Chlorine Contact Chamber

Size: One 20' x 11' 3" x 9' 9"
 (13,950 gal)
 Retention: 30.2 min

OUTFALL

- to creek

SLUDGE HANDLING

Digestion System - Single-stage

Type: C.P. Pontoon-type floating cover;
 mixed by recirculation
 Size: One 45' dia x 20' swd (36,000 cu ft
 or 224,000 gal)
 Loading: 1.32 lb/cu ft/mon

PUMPING STATION

John Pound Street Pumping Station

Type: Chicago Pump
 Size: One 458 gpm @ 26½' tdh
 One 687 gpm @ 29½' tdh
 One 917 gpm @ 33½' tdh
 with One C.P. Barminutor
 Type "B" (18")

'69 REVIEW

The project consists of a 0.67 mgd diffused air activated sludge sewage treatment plant including comminution, grit removal, chlorination, single-stage digestion and liquid sludge haulage. It also includes an above-ground pumping station and forcemain, and approximately $3\frac{1}{2}$ miles of sewers varying in diameter from eight to 18 inches. The plant is built on a two-acre plot in Coronation Park, in the southeast section of the town. It is downstream and upwind of the town.

During 1969, the operating staff had minor problems with the flow recorder which were corrected. Inspections of the structures and grounds showed that they were well maintained and in good condition. An electrical and mechanical inspection of the project equipment revealed no major deficiencies.

EXPENDITURE

The operating cost for the year was \$30,605.11, a decrease of approximately \$2,000.00 from 1968. The unit cost of treating one million gallons, however, increased from \$123.91 in 1968 to \$142.61 in 1969 due to greatly decreased flows.

PLANT FLOWS and CHLORINATION

A total of 214.6 million gallons of sewage was treated at the plant in 1969, compared to 263.12 million gallons in 1968. The average daily flow was 590,000 gallons and represented 89% of the design capacity of the plant. This decrease of 19% from 1968 was mainly due to the closing of a local dairy late in 1968.

During 1969, the average daily flow on a monthly basis was above the design value of 665,000 gpd in January, February, April and May. The minimum day recorded was 0.39 million gallons in October; the maximum recorded was 1.31 mil. gal. in January. The maximum day flow was 196% of the design flow.

It should be noted that none of the recorded flows includes the flows that completely bypass both plant and meter during periods of heavy infiltration. From the probability graph, it can be seen that the design capacity of the plant was exceeded 13% of the time on the metered flows.

The final effluent was chlorinated for the full year. A total of 9,430 pounds of chlorine was used at an average dosage of 4.4 milligrams per litre. The average chlorine residual was 0.5 mg/l in the final effluent prior to discharge into Otter Creek.

PLANT EFFICIENCY

A raw sewage with an average strength of 216 mg/l BOD and 285 mg/l suspended solids was treated in 1969. The final effluent had an average strength of 11 mg/l BOD and 15 mg/l suspended solids, representing reductions of 94 percent for both. The final effluent exceeded the OWRC's objectives of 15 mg/l 13% of the time for BOD and 23% of the time for suspended solids.

A total of 361,000 pounds of BOD and 466,000 pounds of suspended solids was removed during the year.

The 355 cu. ft. of grit removed averaged 29 cu. ft. per month. This represents a grit removal of 1.65 cu. ft. per million gallons of raw sewage and is normal.

SLUDGE DIGESTION and DISPOSAL

Approximately 2.8 million gallons of raw sludge were pumped to the digester. A total of 590,000 gallons of digested sludge at an average concentration of 2.5 percent was trucked away for disposal. This amounted to 20.8% of the raw sludge pumped to the digester of 16.4 cu. yd. per million gallons of raw sewage.

AERATION

The average BOD of the primary effluent to the aeration section was 265 mg/l, which was 49 mg/l higher than the raw sewage value due to recirculation of digester supernatant. Suspended solids in the primary effluent to this section averaged 367 mg/l, 82 mg/l higher than the raw sewage value.

The final effluents of 11 mg/l (BOD) and 15 mg/l (suspended solids) were lower than and equal to OWRC objectives of 15 mg/l for each.

During 1969, the average MLSS was 1847 mg/l, resulting in an average loading of 0.28 lbs. of BOD per pound of MLSS. An average of 2250 cu. ft. of air per pound of BOD were removed.

CONCLUSIONS

This project was well run throughout 1969, and experienced no major problems.

Although treatment demands were lower than in the previous year, local industrial growth and more residential subdivisions require that the expansion of the project proceed as planned.

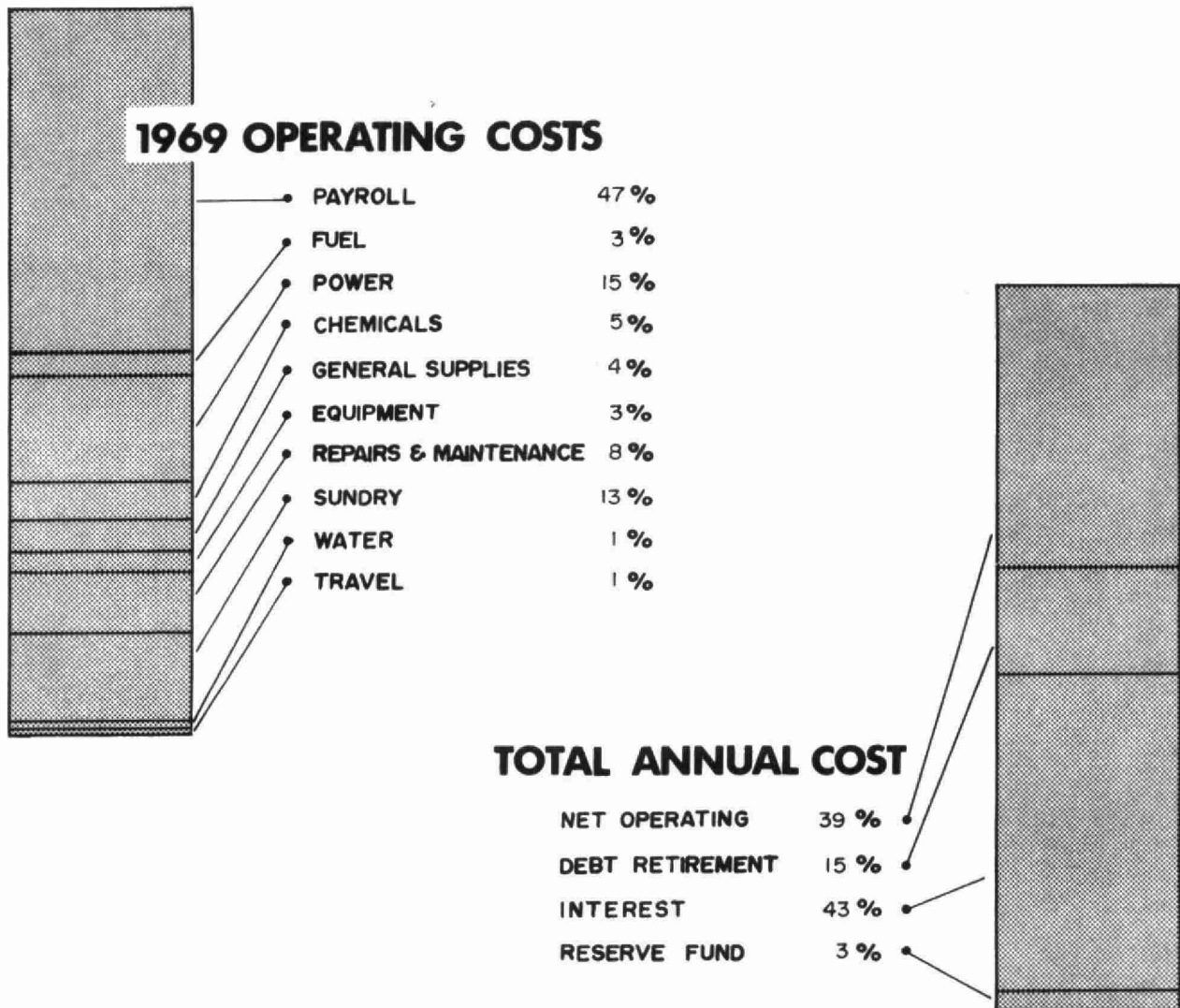
During 1970, therefore, the treatment plant, pumping stations, forcemain and outfall sewer will become provincially-financed under project no. 1-0137-67. Expansion plans will be completed and construction should start late in the year.

PROJECT COSTS

NET CAPITAL COST (Final) Long Term Debt to OWRC	<u>\$608,456.51</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	<u>\$122,831.90</u>
Net Operating	\$ 30,605.11
Debt Retirement	12,279.00
Reserve	2,590.59
Interest Charged	<u>34,064.35</u>
TOTAL	<u>\$ 79,539.05</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 29,958.30
Deposited by Municipality	2,590.59
Interest Earned	<u>1,719.97</u>
	\$ 34,268.86
Less Expenditures	<u>807.86</u>
Balance @ December 31, 1969	<u>\$ 33,461.00</u>



Yearly Operating Costs

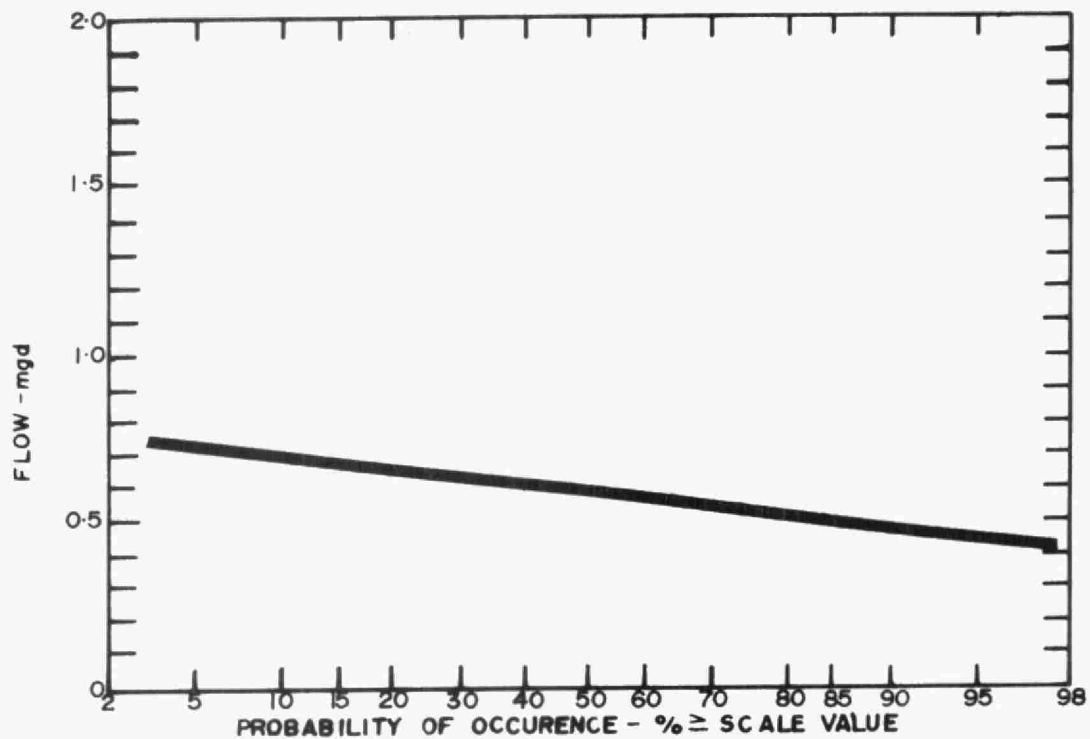
YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	223.49	\$25,142.33	\$112.49	6 cents
1966	266.67	27,281.70	102.30	5 cents
1967	277.33	32,326.18	116.56	4 cents
1968	263.12	32,604.46	123.91	5 cents
1969	214.6	30,605.11	142.61	7 cents

Monthly Operating Costs

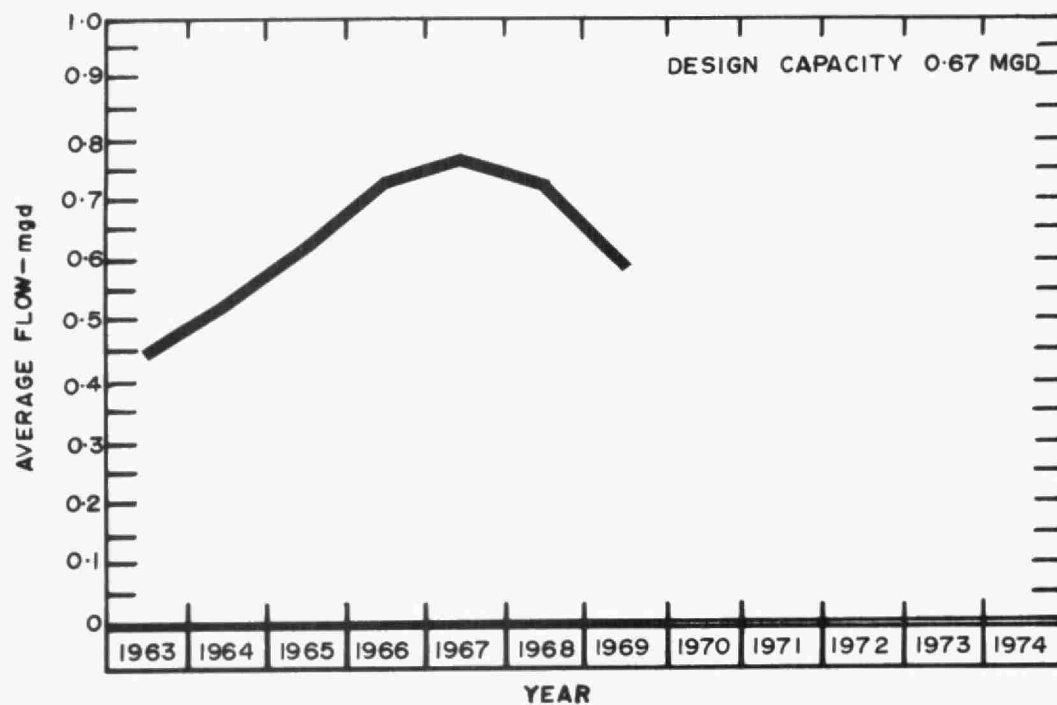
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	2582.43	1613.42	-	-	429.44	62.44	47.66	311.87	101.60	-	16.00	-
FEB	2325.73	1086.32	-	130.80	327.82	238.61	140.40	50.00	320.77	15.01	16.00	-
MAR	2287.74	1086.32	-	125.10	327.34	-	57.62	343.86	60.75	270.75	16.00	-
APR	2508.22	1246.85	-	-	322.26	-	199.31	74.68	166.88	482.24	16.00	-
MAY	2504.21	1251.30	-	-	330.60	-	124.71	3.75	464.53	313.32	16.00	-
JUNE	2399.67	1116.75	-	134.25	400.26	229.54	90.39	-	193.51	218.97	16.00	-
JULY	2828.46	1115.77	-	-	439.01	238.61	67.13	46.06	241.94	548.89	16.00	115.05
AUG	2605.78	1643.60	-	137.70	434.71	220.50	54.45	-	81.73	17.09	16.00	-
SEPT	2882.43	1108.26	-	-	492.72	220.50	64.54	69.37	252.79	658.25	16.00	-
OCT	2298.21	1098.46	-	-	453.31	-	102.88	-	324.76	302.80	16.00	-
NOV	1815.88	1100.14	-	138.62	328.03	-	43.05	-	70.47	64.32	16.00	55.25
DEC	3566.35	1113.32	-	142.29	326.99	220.50	294.43	50.13	177.79	1175.55	16.00	49.35
TOTAL	30605.11	14580.51	-	808.76	4612.49	1430.70	1286.57	947.72	2457.52	4067.19	192.00	219.65

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$3223.35

PROCESS DATA

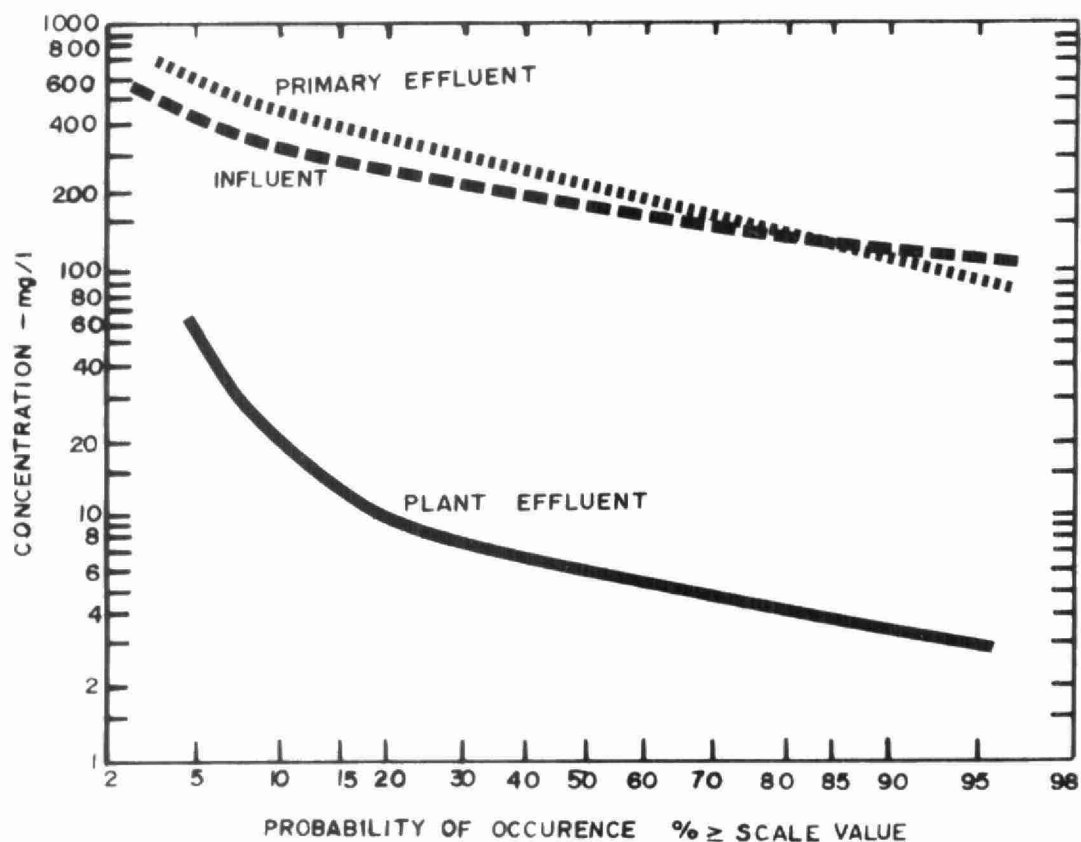


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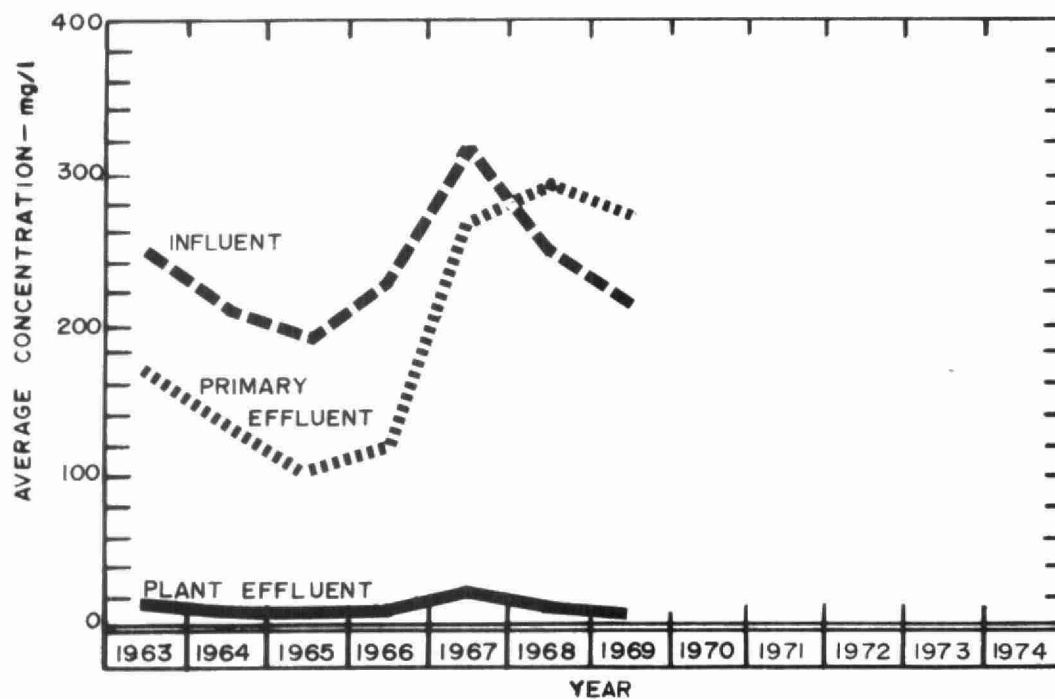


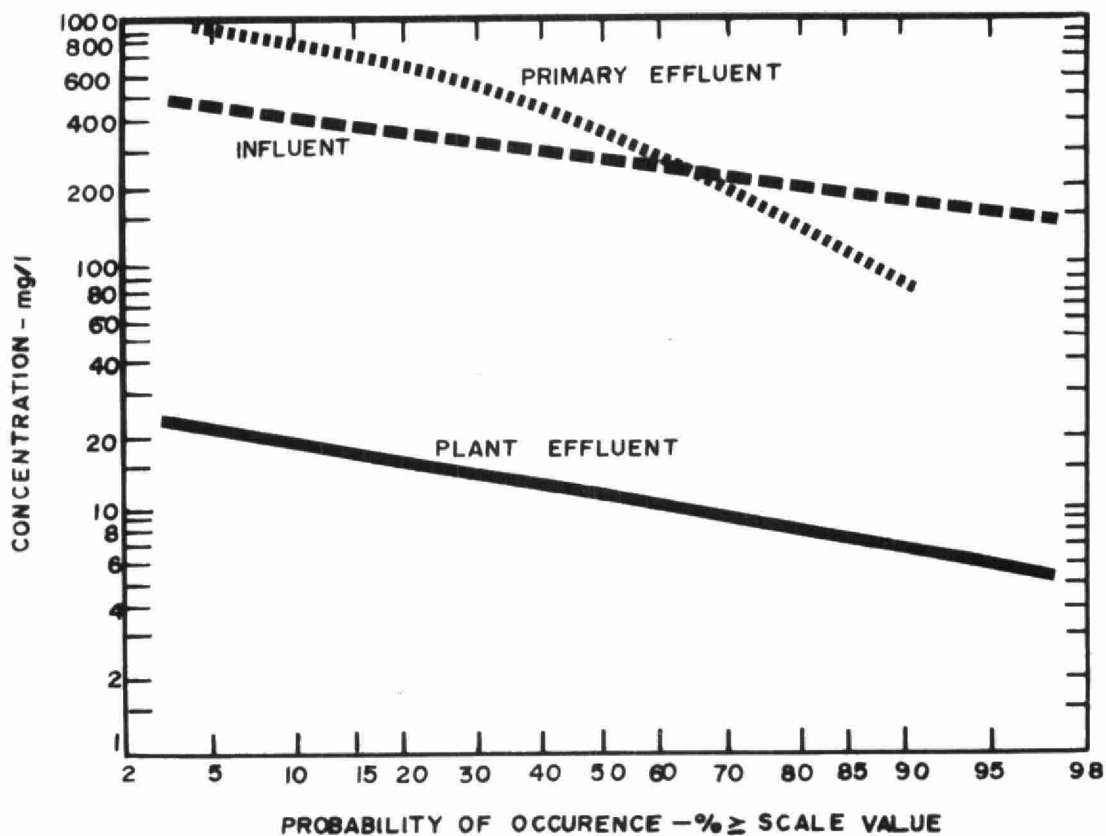
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 pounds	DOSAGE mg/l
JAN	22.4	.72	1.31	.58	1072	4.8
FEB	18.9	.67	.77	.62	689	3.7
MAR	18.4	.60	.70	.53	661	3.6
APR	20.7	.69	.78	.61	691	3.3
MAY	21.4	.69	.95	.62	745	3.5
JUNE	18.8	.63	.69	.53	754	4.0
JULY	16.7	.54	.62	.47	840	5.0
AUG	15.0	.48	.55	.41	846	5.6
SEPT	14.6	.49	.54	.43	877	6.0
OCT	14.5	.47	.54	.39	759	5.2
NOV	16.5	.54	.67	.50	800	4.9
DEC	16.7	.53	.68	.47	696	4.2
TOTAL	214.6	-	-	-	9430	-
AVERAGE	-	.59	-	-	785	4.4

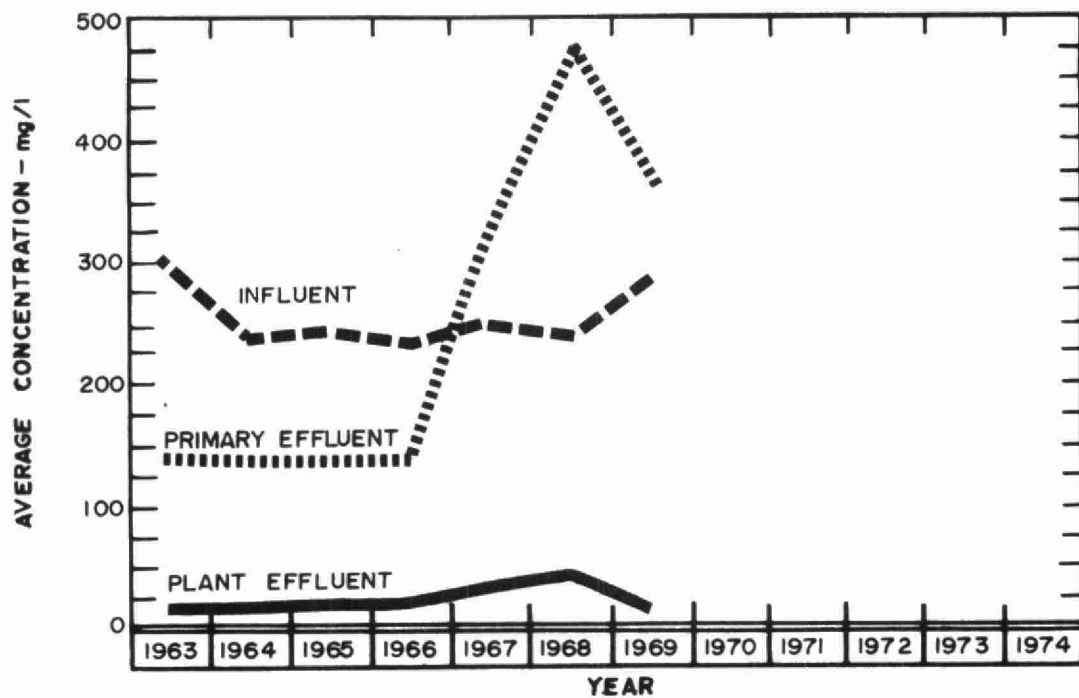


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS

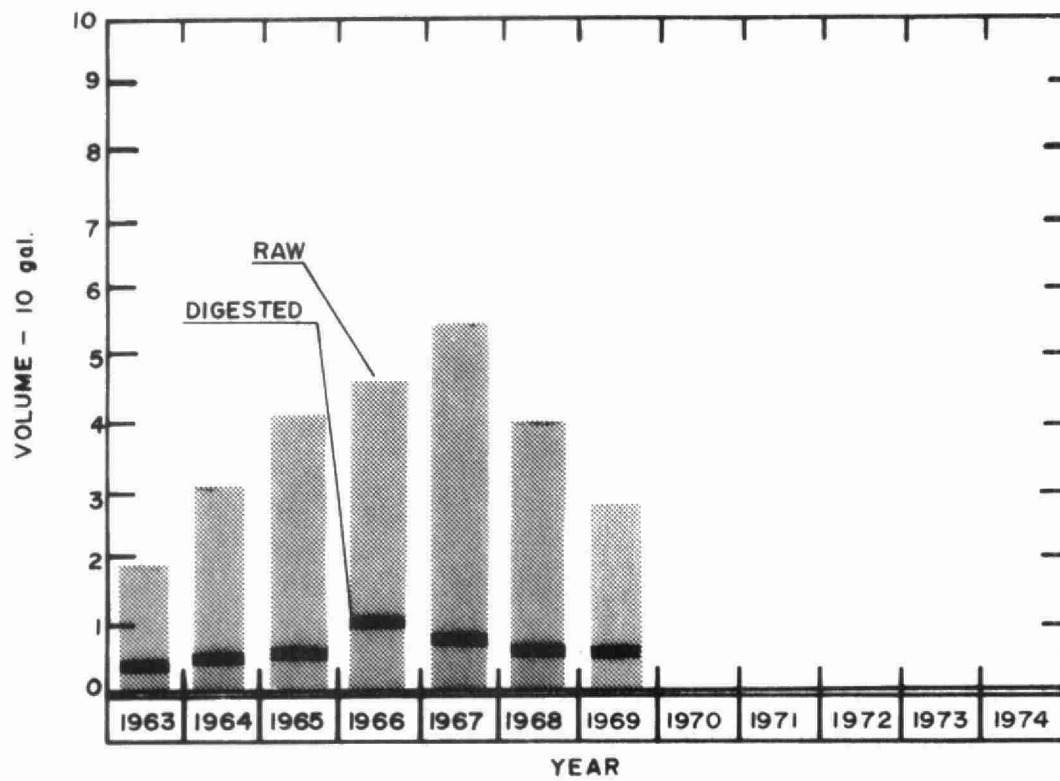


PLANT EFFICIENCY

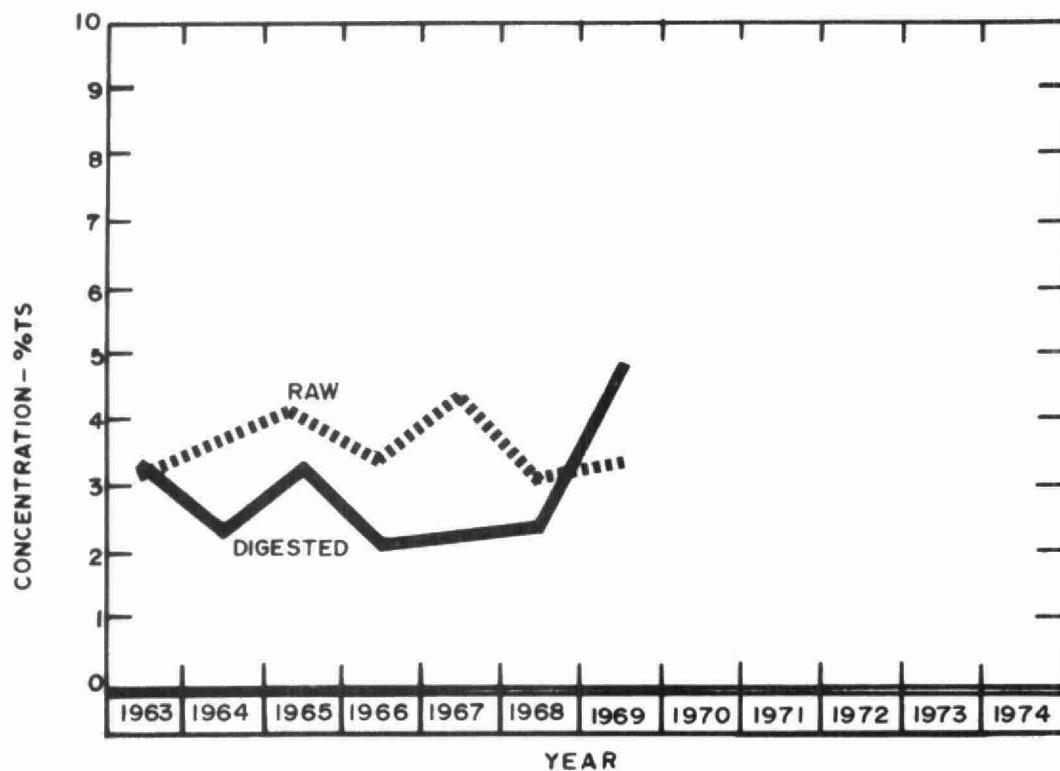
MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ³ pounds			%	10 ³ pounds	cu
JAN	160	6	96	34.6	190	12	94	40.0	41
FEB	195	11	94	34.7	260	12	95	46.8	22
MAR	213	8	96	37.8	255	12	95	44.8	25
APR	176	7	96	35.0	249	15	94	48.4	36
MAY	210	18	91	41.2	300	14	95	61.3	28
JUNE	270	10	96	48.8	340	15	96	61.0	29
JULY	145	5	97	23.4	253	12	95	40.3	30
AUG	213	4	98	31.3	267	15	94	37.8	20
SEPT	285	5	98	40.9	357	10	97	50.8	30
OCT	252	38	84	30.9	215	41	81	25.1	32
NOV	212	10	95	33.3	253	10	96	40.1	32
DEC	260	10	96	41.8	389	10	97	63.3	30
TOTAL	-	-	-	-	-	-	-	559.7	355
AVERAGE	216	11	94	36.1	285	15	94	46.6	29

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE 10 ³ lb
		BOD	SS	BOD	SS				
		mg/l	mg/l	mg/l	mg/l				
JAN	.72	107	116	6	12	1400	.20	2.26	-
FEB	.67	129	119	11	12	1430	.22	2.08	124.
MAR	.60	120	189	8	12	1620	.16	2.44	60.
APR	.69	144	326	7	15	1760	.20	1.73	96.
MAY	.69	167	331	18	14	1730	.24	1.60	87.6
JUNE	.63	607	651	10	15	1750	.78	.60	101.9
JULY	.54	213	594	5	12	2370	.17	2.28	86.1
AUG	.48	300	385	4	15	2250	.18	1.80	68.6
SEPT	.49	580	599	5	10	2280	.44	8.27	-
OCT	.47	305	450	55	53	2270	.23	1.31	-
NOV	.54	340	474	10	10	1700	.38	.89	-
DEC	.53	177	177	10	10	1610	.20	1.79	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.59	265	367	11	15	1847	.28	2.25	89.2



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ⁴ gal	%	%	10 ⁴ gal	%	%	10 ⁴ gal	%	cu yd	cu yd
JAN	18.9	3.7	-	4.8	2.5	-	15.0	2.0	286	-
FEB	17.0	2.9	-	3.5	2.5	-	13.6	2.4	208	-
MAR	20.9	3.6	-	4.0	2.3	-	15.1	2.7	234	-
APR	20.3	3.6	-	3.7	2.7	-	16.1	2.8	221	-
MAY	20.9	3.5	-	4.0	2.7	-	17.1	2.6	234	-
JUNE	25.6	3.1	-	5.6	2.6	-	15.6	2.4	332	-
JULY	30.6	3.9	-	5.3	2.3	-	24.8	2.1	312	-
AUG	31.4	2.8	-	5.9	2.5	-	25.6	1.9	351	-
SEPT	24.2	4.7	-	5.9	2.4	-	18.6	1.8	351	-
OCT	25.0	3.3*	-	5.9	2.4	-	19.8	2.0	351	-
NOV	23.4	3.0	-	5.2	2.5*	-	18.6	2.5*	312	-
DEC	24.3	4.2	-	5.5	2.2	-	19.5	2.3	326	-
TOTAL	282.5	-	-	59.3	-	-	219.4	-	3518	-
AVERAGE	23.5	3.3	-	4.9	2.5	-	18.2	2.5	293	-

* Prorated average

[illegible]



Water management in Ontario